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by Marc Frenette and Ping Ching Winnie Chan

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^{p} preliminary
^{r} revised
x suppressed to meet the confidentiality requirements of the *Statistics Act*
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F too unreliable to be published
* significantly different from reference category ($p < 0.05$)

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Why Are Academic Prospects Brighter for Private High School Students?

by Marc Frenette and Ping Ching Winnie Chan, Social Analysis and Modelling Division

This article in the *Economic Insights* series examines academic outcomes of public and private high school students and the factors associated with the differences across sectors. A longer, more detailed study is also available.[1] The article is part of a series examining the academic outcomes of youth.

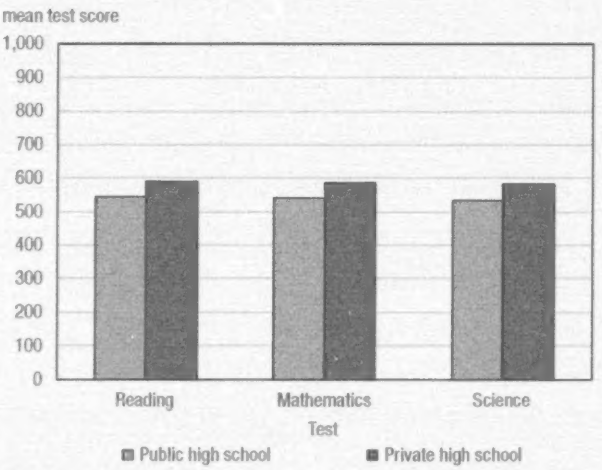
Introduction

In Canada, about 6% of 15-year-olds attend a private school.[2] Although some provincial governments subsidize a portion of the costs, parents must still pay for their child to attend.

Differences in the academic outcomes of children who attend public and private schools continue to attract public attention. A central issue is the extent to which better outcomes among private school students are attributable to students' socio-economic characteristics or to differences in school resources and practices.

This article examines a survey sample of 7,142 15-year-olds who were registered in Grade 10 in public and private high schools[3] and subsequently followed until age 23. The follow-up period facilitates analysis of a broad range of academic outcomes, including test scores at age 15 and educational attainment by age 23. The study focuses on: (1) the gaps in academic outcomes by school sector; (2) differences in factors associated with academic outcomes (socio-economic characteristics, province of school attendance, school resources and practices, and peer characteristics) by school sector; and (3) the proportion of the gaps in academic outcomes that are associated with these factors.

Chart 1
Mean test scores by type of high school attended



Note: The sample consists of individuals who were born in 1984, were in Grade 10, lived in Canada (excluding the Atlantic provinces and the territories) in April or May 2000, and responded to a follow-up survey in 2008. Test scores are measured at age 15 in 2000.
Sources: Statistics Canada, Youth in Transition Survey, Cohort A; and Organisation for Economic Co-operation and Development, Programme for International Student Assessment.

Private school students have higher test scores and educational attainment

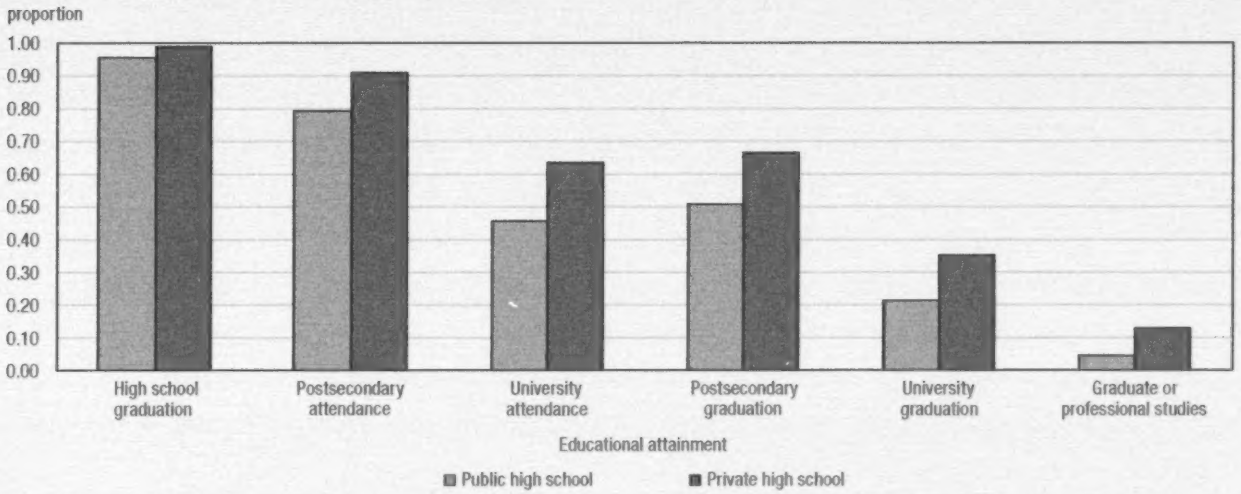
On average, students who attended private high schools scored higher on academic tests at age 15, and achieved higher levels of educational attainment by age 23, than did those who attended public high schools.[4]

On average, Canadian students outperformed students in other Organisation for Economic Co-operation and Development (OECD) countries in the areas of reading, mathematics, and science.[5] However, the difference between Canadian students attending private and public high schools was substantial. Specifically, private school students scored 43 to 47 points (8% to 9%) higher than public school students on average on the three tests.[6]

The higher achievement of private high school students extended to educational attainment (Chart 2). By age 23, those who had attended a private high school were on average more likely to have graduated from high school, attended and graduated from a postsecondary institution, attended and

1. See Frenette and Chan (2014).
2. This is based on the Programme for International Student Assessment (PISA), which sampled 15-year-olds enrolled in schools in 2000 (OECD 2011) and who were subsequently followed until age 23 (in 2008).
3. The sample is further limited to students living outside of the Atlantic provinces (where private school attendance is very low in the data).
4. The samples are not large enough to break down results by type of private school (e.g., sectarian versus non-sectarian).
5. See Bussière et al. (2001).
6. The "Data sources" section contains a description of the PISA tests.

Chart 2
Educational attainment by type of high school attended



Note: The sample consists of individuals who were born in 1984, were in Grade 10, lived in Canada (excluding the Atlantic provinces and the territories) in April or May 2000, and responded to a follow-up survey in 2008. Educational attainment is measured at age 23.
Sources: Statistics Canada, Youth in Transition Survey, Cohort A; and Organisation for Economic Co-operation and Development, Programme for International Student Assessment.

graduated from a university, and begun graduate or professional studies (university programs leading to a master's, doctoral, or professional degree).The difference in high school graduation rates was small (about 3 percentage points), but differences in postsecondary enrolment and graduation rates were substantial. For example, 35% of private school students had graduated from a university program by age 23, compared with 21% of public school students. Moreover, private school alumni were almost three times as likely to have started graduate or professional studies: 13% versus 5%.

These differences in academic achievement do not take into account the possibility that the socio-economic background and peers[7] of students who attend private and public schools may differ. As well, private and public schools may have different resources or practices, or follow different curricula if they are concentrated in specific provinces. The remainder of this article examines these factors and their role in the differences between private and public sector educational outcomes.

Parents of private high school students have more education, higher incomes

Private high schools generally charge tuition fees, which may or may not be partially subsidized by provincial governments. Not surprisingly, students who attend private high schools tend to come from more affluent families. "Equivalent" total income was 25% higher among the parents of private school students, compared with those of public school students: $44,600 versus $35,600.[8,9]

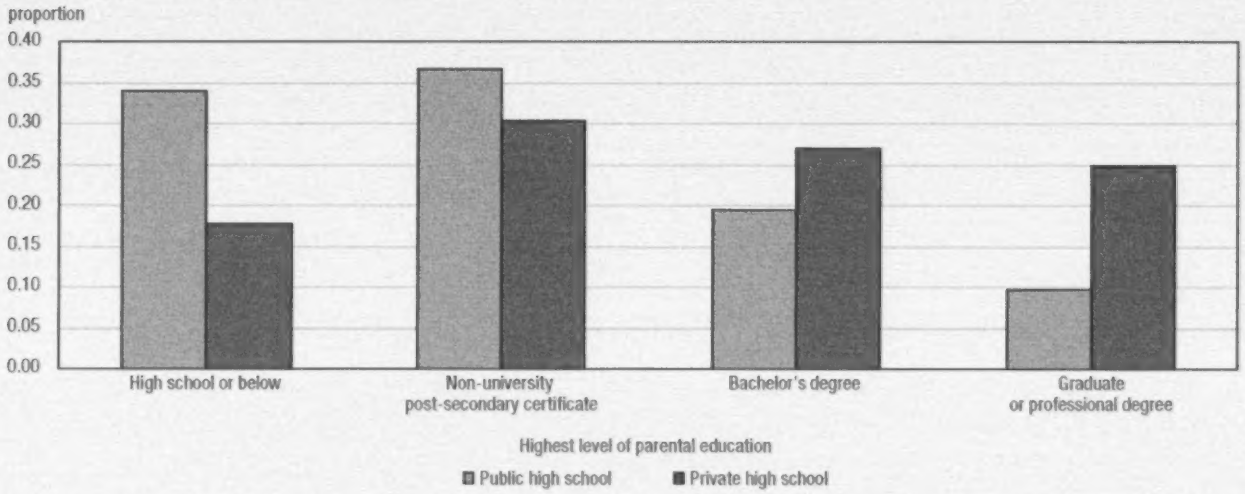
Furthermore, previous research has shown that parents' education is even more important than income in understanding a child's educational attainment.[10] Public high school students were almost twice as likely as their private high school counterparts to have parents whose education did not extend beyond high school graduation (34% versus 18%—Chart 3). Conversely, private school students were two and a half times as likely to have a parent who completed a graduate or professional degree (25% versus 10%). More broadly, the peers of private school students tended to have more highly educated parents. Specifically, 52% of the peers of private school students had a university-educated parent, compared with 28% of their public school counterparts.

Few differences in school resources and practices

Information on school characteristics were collected from school principals. Few differences in resources and practices were reported by those in public and private high schools (Table 1). For example, the student-teacher ratio was slightly higher in private than in public schools, at 18 versus 17 students per teacher, and the number of computers per student was similar as well (about 0.2 per student in both). The average annual number of instructional hours was moderately higher in public schools (968 versus 945). Teacher qualifications, the availability of special tutoring, and teacher feedback were also generally similar in both sectors.

7. See Frenette and Chan (2014) for a review of the literature on peer effects in an educational context.
8. Figures are expressed in 2008 dollars.
9. Equivalent income is a per family member measure, after accounting for the economies of scale associated with larger families. It is derived by dividing total income by the square root of the number of members in the family. A family of four with an equivalent income of $44,600 has a total (unadjusted) income of $89,200.
10. See Frenette (2007).

Chart 3
Highest level of parental education by type of high school attended



Note: The sample consists of individuals who were born in 1984, were in Grade 10, lived in Canada (excluding the Atlantic provinces and the territories) in April or May 2000, and responded to a follow-up survey in 2008.
Sources: Statistics Canada, Youth in Transition Survey, Cohort A; and Organisation for Economic Co-operation and Development, Programme for International Student Assessment.

Table 1
School resources and practices by type of high school attended

	Public high school	Private high school
	mean	
Sectarian	0.318	0.806
Semestered	0.692	0.255
Enrolment	1,079.9	712.8
Student–teacher ratio	17.0	17.8
Total annual instructional hours	967.6	945.1
Number of computers per student	0.191	0.200
Percentage of teachers with an undergraduate degree	93.0	87.1
Percentage of English/French teachers with undergraduate degree in English/French language and literature	81.9	81.3
Percentage of certified teachers	96.7	97.1
Percentage of teachers participated in training in last three months	59.3	52.3
Special tutoring available from staff members	0.796	0.798
Low expectations from teachers		
Does not hinder learning at all	0.528	0.716
Hinder learning a little	0.383	0.279
Hinder learning some or a lot	0.089	0.005
Teacher feedback		
Less than three times per year	0.014	0.000
Three times per year	0.035	0.057
Four or more times per year	0.950	0.943

Note: The sample consists of individuals who were born in 1984, were in Grade 10, lived in Canada (excluding the Atlantic provinces and the territories) in April or May 2000, and responded to a follow-up survey in 2008.
Sources: Statistics Canada, Youth in Transition Survey, Cohort A; and Organisation for Economic Co-operation and Development, Programme for International Student Assessment.

The most notable differences between public and private high schools were in total enrolment, academic term structure (semestered versus full-year courses), and being religiously affiliated ("sectarian"). Specifically, average enrolment in public schools was substantially larger than in private schools (1,080 versus 713). Private schools were far more likely to be sectarian (81% versus 32%), but far less likely to offer a semestered system (25% versus 69%).

According to responses from school principals, an area that favoured private schools was teachers' expectations. In the private sector, 72% of principals believed that low teacher expectations of students did not hinder learning at all, while 53% of principals in the public sector expressed this view.

The curricula followed by public and private school students may have also differed. This is because school curricula vary by province, and private schools tend to be concentrated in certain provinces. For example, 56% of private school students attended school in Quebec, compared with 16% of public school students. Conversely, 12% of private school students attended school in Ontario, compared with 48% of public school students.

Socio-economic characteristics, peers and province of school attendance associated with differences in academic outcomes

Differences in socio-economic characteristics, school resources and practices, peers, and province of school attendance could potentially influence academic outcomes among private and public school students.[11]

In fact, two factors—socio-economic characteristics and peers—consistently accounted for much of the differences in the academic outcomes of these groups (Table 2). The province of school attendance accounted for a substantial portion of the differences in academic outcomes at the high school level (test scores and graduation rates), but generally not at the postsecondary level. School resources and practices played little or no role in accounting for the differences in any of the academic outcomes.

For example, about 85% of the difference in average reading scores was accounted for by differences in socio-economic characteristics (27%), peers (28%), and province of school attendance (29%). Likewise, about 91% of the difference in university attendance was accounted for by socio-economic characteristics (55%) and peers (36%).

Conclusion

Three conclusions emerge from this study.

First, on average, students who attended private high schools scored higher on academic tests at age 15, and had higher levels of educational attainment by age 23, than did students who attended public high schools.

Second, the characteristics of public and private high school students were different. Compared with public high school students, those in private schools generally came from families with a higher socio-economic status (as measured by parental income and education), and were more likely to be surrounded by peers whose parents had attended university. As well, public and private schools were concentrated in different provinces, and thus, may have followed different curricula. However, few differences in resources and practices across school sectors were observed.

Finally, two factors accounted for a substantial portion of the differences between the public and private sectors in all of the academic outcomes examined: socio-economic characteristics and peers. The province of school attendance accounted for a substantial portion of the differences in academic outcomes at the high school level (test scores and graduation rates), but less at the postsecondary level. School resources and practices played little to no role in the differences in each academic outcome observed.

Table 2
Proportion of the total gap in academic outcomes accounted for by differences in characteristics

Outcome variable	Province of school attendance	Socio-economic	School resources and practices	Peers	Unobserved factors	Total
			proportion			
Reading score	0.293	0.271	-0.007	0.283	0.160	1.000
Mathematics score	0.523	0.270	-0.084	0.324	-0.032	1.000
Science score	0.255	0.286	0.130	0.170	0.159	1.000
High school graduation	0.722	0.527	-0.137	0.224	-0.337	1.000
Postsecondary attendance	0.084	0.409	-0.238	0.290	0.456	1.000
University attendance	-0.009	0.547	0.123	0.364	-0.025	1.000
Postsecondary graduation	0.320	0.203	-0.090	0.133	0.434	1.000
University graduation	-0.010	0.421	0.054	0.270	0.265	1.000
Graduate or professional studies	0.165	0.248	0.056	0.177	0.354	1.000

Note: The sample consists of individuals who were born in 1984, were in Grade 10, lived in Canada (excluding the Atlantic provinces and the territories) in April or May 2000, and responded to a follow-up survey in 2008.

Sources: Statistics Canada, Youth in Transition Survey, Cohort A, and Organisation for Economic Co-operation and Development, Programme for International Student Assessment.

11. See the "Methods" section for a description of how differences in outcomes can be decomposed into the proportion accounted for by various factors..

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Data sources, methods and definitions

Data sources

This study is based on data from the Youth in Transition Survey, Cohort A (YITS-A) and the Programme for International Student Assessment (PISA). The Organisation for Economic Co-operation and Development (OECD) designed PISA, which was administered throughout OECD countries. In Canada, the YITS-A was developed by Statistics Canada to add contextual background information on students and their parents to the PISA data.

The target population consisted of students born in 1984. The YITS-A–PISA sample was derived from a two-stage, stratified random sampling design administered in the 10 provinces. In the first stage, a provincially stratified random sample of schools in which students born in 1984 were enrolled was taken in April or May of 2000. The list of schools was provided by each provincial Ministry of Education and included private schools. In each school, a random sample of students born in 1984 was taken (whether or not they were in Grade 10).

The analytical sample consists of students in Grade 10 in 2000 (the usual grade for students born in 1984). They were sampled in the Spring of 2000 so that students who were held back or skipped a grade would not be included in the sample. Because very few students in the sample attended private schools in the Atlantic provinces, the analytical sample is limited to students who lived in the other provinces. The final sample consists of 560 private high school students and 6,582 public high school students.

This study examined several academic outcomes, including scores from written tests of reading, mathematics, and science, administered to 15-year-olds by the OECD. The tests lasted two hours and focused primarily on reading. All students took the reading test, after which about half of them were randomly assigned to take the mathematics test, and the other half, the science test. The PISA assessment focused on the application of knowledge that students are expected to acquire in the classroom to real-world problems. Exam results were standardized to have an average of 500 and a standard deviation of 100 across OECD countries.

This study follows students until age 23, allowing for the measurement of several additional educational outcomes, including high school graduation, postsecondary attendance and graduation, university attendance and graduation, and graduate or professional studies. To account for sample attrition between the surveys administered at ages 15 and 23, sample survey weights were applied to all estimates in this article. All the estimates were weighted by the students in the sample attending either a public or private high school.

To account for differences between the academic outcomes of students in public and private schools, four broad areas were examined:

- socio-economic characteristics (parental income and education, number of parents in the home, immigrant status of parents, number of books and computers in the home, sex of the student, immigrant status of the student, membership in a visible minority group, presence of a disability, and urban versus rural residence)
- province of school attendance (may account for different curricula in each province)
- school resources and practices (sectarian status, semestered, total enrolment, student–teacher ratio, total annual instructional hours, number of computers per student, percentage of teachers with an undergraduate degree, percentage of English/French teachers with an undergraduate degree in English/French language and literature, percentage of teachers who are certified, percentage of teachers who participated in training in the last three months, special tutoring available from staff, extent to which teacher expectations hinder learning, and frequency of teacher feedback)
- peers (percentage of same-age school peers whose parents have a postsecondary certificate or degree)

Data sources, methods and definitions (continued)

This information was collected when students were aged 15.

Methods

This analysis presents means and proportions by school sector (public and private), as well as Blinder-Oaxaca decompositions. The objective of the decompositions is to estimate the contribution of the four broad factors (socio-economic characteristics, province of school attendance, school resources and practices, and peers) in accounting for the differences in academic outcomes. The total gap in each outcome (between public high school and private high school students) is decomposed into the proportion accounted for by each factor (the differences in mean levels of these factors, multiplied by the coefficient associated with the factor in a pooled regression model where the dependent variable is the outcome in question).

Definitions

Private school: A school whose affairs are under the control of a private entity. Funding source is not a consideration in determining the school sector. In order to grant provincially recognized high school diplomas, the private school must follow the provincial curriculum.

Public school: A school whose affairs are under the control of a public entity. The funding source is not a consideration in determining the school sector. In order to grant provincially recognized high school diplomas, the public school must follow the provincial curriculum.

PISA tests: 15-year-old students took a two-hour written test in reading, and either a mathematics or science test. All students took the reading test, after which half of them were randomly assigned to take a mathematics test, and the other half, a science test. The PISA assessment focused on students' application of knowledge that they are expected to acquire in school to real-world problems. Exam results were standardized to have an average of 500 and a standard deviation of 100 across OECD countries.